DOCUMENT RESUME

ED 060 038 TM 001 121

AUTHOR	Ward, William C.; Warren Patricia A.
TITLE	A Field Study of Nonverbal Creativity.
INSTITUTION	Educational Testing Service, Princeton, N.J.
REPORT NO	ETS-RB-71-47
PUB DATE	Aug 71
NOTE	31p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Complexity Level; Correlation; *Creativity Research; *Field Studies; Humor; Marital Status; Multiple Regression Analysis; *Nonverbal Communication; Originality; Predictor Variables; Rating Scales; *Sex Differences; *Socioeconomic Background; Statistical Analysis

ABSTRACT

Creative products submitted in response to a contest were examined to discover whether creativity was related to the sex and socioeconomic status of the respondent and whether characteristics of the objects could be specified which would predict their level of rated creativity. No sex difference was found, but socioeconomic status was significantly associated with creativity. Ratings of the objects on several simple dimensions proved effective in predicting rated creativity. (Author/MS)

ED 060038

RESEARCH BULLETIN

RB-71-47

A FIELD STUDY OF NONVERBAL CREATIVITY

William C. Ward

and

Patricia A. Warren

This Bulletin is a draft for interoffice circulation. Corrections and suggestions for revision are solicited. The Bulletin should not be cited as a reference without the specific permission of the authors. It is automatically superseded upon formal publication of the material.

TM 001 121

Educational Testing Service

Princeton, New Jersey

August 1971

A FIELD STUDY OF NONVERBAL CREATIVITY

William C. Ward and Patricia A. Warren

Educational Testing Service

Abstract

Creative products submitted in response to a contest were examined to discover whether creativity was related to the sex and socioeconomic status of the respondent and whether characteristics of the objects could be specified which would predict their level of rated creativity. No sex difference was found, but socioeconomic status was significantly associated with creativity for those objects to which at least a moderate amount of effort had been devoted. Ratings of the objects on several simple dimensions proved effective in predicting rated creativity. Judges differed on which dimension best predicted their creativity ratings, but differences between subsets of the objects were of greater importance than individual differences among judges in determining the bases on which the ratings were made.

A FIELD STUDY OF NONVERBAL CREATIVITY[1]

William C. Ward and Patricia A. Warren

Educational Testing Service

Most empirical investigations of creativity have used such easily accessible populations as school and college students, though studies of individuals whose professional productivity has been noteworthy provide an important exception (e.g., MacKinnon, 1962a). Thus, when the opportunity arose to examine the creative products of a heterogeneous sample of adults in a nonlaboratory setting, it seemed worth while to do so despite the lack of control over confounding variables which is inherent in field investigations.

In March, 1969, a New York radio station held a "Little Green Things" contest. Listeners were invited to submit humorous and original little green things; the best would receive a $300 prize, and there were ten consolation awards of $20 each. The contest ended on Saint Patrick's Day, but no suggestion was made as to appropriate themes or the kind of product desired. After a few necessary deletions--living things, perishables, money--the several thousand entries were made available for the present research.

Interest in examining these objects revolved around two problems. First, is the degree of creativity shown by a product related to characteristics of the individual who contributed that product? In particular, is nonverbal creativity associated to a significant degree with either the sex or the socioeconomic status of the respondent? The available data suggest different answers to this question, depending on which of two bodies of research is

examined. Studies in which objective tests of creativity have been administered to relatively unselected groups of subjects (generally students) have not found superior performance to be consistently associated with one sex (e.g., Torrance, 1963; Wallach & Kogan, 1965) or with higher socioeconomic status (e.g., Covington, 1968; Zambito, 1968), although not all the data are consistent for either of these variables (Klausmeier & Wiersma, 1964; Savoca, 1965). Studies of outstandingly productive people, on the other hand, have tended to deal with individuals of above-average socioeconomic status (Helson & Crutchfield, 1970; MacKinnon, 1962b) who are almost always males. The limitation to males to some extent represents an assumption that women are not to be found in positions requiring great productivity; for example, Terman and Oden, in discussing the achievement of their sample, commented that "The study has been limited to men because of the lack of a yardstick by which to estimate the success of women . . . no one has yet devised a method for identifying the best housewives and mothers, and this is what the vast majority of women aspire to be" (Terman & Oden, 1947, p. 311). The one exception encountered was Helson's (1967) study of creative mathematicians; she noted that her 18 creative female mathematicians "included virtually every creative woman mathematician in the country" (p. 216) and that, in comparison with a representative sample of creative male mathematicians, only two women had published as many papers as the average for the creative men.

There are a multitude of possible explanations for these discrepancies between the two types of studies, and the present investigation will not appreciably lessen their number. Nonetheless, it may be helpful to have some data from a situation which is in some respects intermediate to the

settings in these two kinds of investigations. Here, the creative product does not come from a testing situation, and it is obtained from individuals who are self-selected for their willingness to present a creative product; to this extent the situation is similar to that in work on outstandingly productive individuals. On the other hand, realization of the creative product is possible for individuals who are quite ordinary with respect to intelligence, motivation to achieve, and special educational and professional opportunities; to this extent the situation is more similar to that which has been used in the creativity testing literature.

The second problem was that of studying the process by which objects are evaluated with regard to creativity. What features of products lead to their being judged high or low on creativity? Are there systematic differences among judges in the bases used for ratings? Skager, Schultz, and Klein (1966) studied these questions with respect to the artistic creativity of students in several schools of design; they found that ratings of artistic products were highly interrelated within clusters of judges, yet were virtually unrelated for judges in different clusters. These results suggest that it may be possible to find both consistencies and systematic differences among judges in their ratings of creativity.

Study 1

The initial examination of these objects concentrated on the first of the two problems raised in the introduction: Is the degree of creativity shown by products related to certain characteristics, especially the sex and socioeconomic status of the individuals who contributed the products? (Analysis of the creativity rating process was reserved for Study 2, which

also served to test the replicability of the results of this study.) Since we had agreed not to contact the contributors, personal information on them was limited to their names and addresses. From the name it was generally possible to code the sex of the respondent and, for females, whether married or single. The street address was used to identify the census tract of residence. On the assumption that individuals participating in the contest tended to be representative of the tracts in which they lived, it was then possible to estimate a number of additional variables by using the median value for a tract as the individual's standing on the index in question.

Two of these variables were of particular interest in that they provided the socioeconomic status estimates for the sample. These were median years of schooling and median family income. Education has been the more frequently used variable in composite indices of social class (e.g., Hollingshead, 1957), but education and income are significantly related to one another and to other possible social class measures, including occupation (Atherton, 1962; Hochbaum, Darley, Monachesi, & Bird, 1955; Kahl & Davis, 1955).

Method

The objects were received in 13 mailbags, not known to differ from one another in any systematic way. Four of these, containing a total of 956 objects, were examined. The 314 objects which were nonperishable and which came from the boroughs of Brooklyn, the Bronx, or Manhattan were retained for analysis. A numbered tag was attached to each object, all other identifying information was removed, and a roster was drawn up to provide information on the sex, the marital status for females, and the address of the contributor.[2]

The nature of the contest was described to four judges, all research assistants, who were then asked to rate each object on "originality." An original contribution was defined as "one which is clever and unusual, one which shows imagination." A seven-point scale was used, ranging from "greatest originality" (7) through "average" (4) to "least originality" (1).

Census data were obtained for the tract from which each object was sent (U.S. Bureau of the Census, 1962). Of chief interest were the two indices of socioeconomic status: median years of schooling, based on individuals 25 years of age or older; and median income, based on the total family income for one year. Other variables present in or derivable from the census data were also recorded; these were total population of the census tract, proportion of individuals of foreign stock, median age for individuals of each sex, and proportion married and proportion widowed of each sex in the tract. Proportion of individuals of foreign stock was of interest because of Helson and Crutchfield's finding that a substantial number of their creative mathematicians were either foreign-born or second-generation Americans (Helson & Crutchfield, 1970); for the remainder of these variables, the only justification for their inclusion was their availability. All the census tract variables with the exception of socioeconomic status proved uniformly to be unrelated to the originality ratings, and they will not be considered further.

Results

Description of items. Table 1 presents a description of the 283 objects in the sample. The categories used are to a large extent arbitrary, but they do suggest the surprising number of near-duplications obtained. Ten

---
Insert Table 1 about here
---

percent of the entries, for example, were leaves, ferns, or flowers; and there were a number of cases in which identical objects were sent by one percent or more of the entrants; e.g., trading stamps, play money bills, garter belts, and Green Giant brand labels. Almost one-fourth of the sample consisted of objects apparently suggested by the Saint Patrick's Day deadline for the contest.

At the same time, the objects within many of these categories showed great diversity in the cleverness and amount of effort they represented. While a number of the Saint Patrick's Day artifacts were commercially available trinkets and cards, for example, there were others such as a leprechaun's cane and a dyed-pebble "blarney stone" which were unique in the sample. Likewise, "monstrous figurines" ranged from a dime-store rubber lizard to a magnificent foot-high hand-crafted old crone.

A second categorization of the objects, independent of the first, was made to distinguish the objects on whether or not they had required at least a modest investment of effort on the part of the individuals who contributed them. "Found Things" were objects which were submitted to the contest in their preexisting state, natural or manufactured, without significant addition or alteration by the contributor. "Made Things" were those to which some change was made; objects were included in this category if the alteration was at least as great as, for example, painting an object green. "Verbal Addition" consisted of objects different from Found Things only through the addition of written information, witty comments, etc.; merely providing a descriptive label was not sufficient for inclusion in this category. Of those things which could be classified in this scheme (a few could not be), 58% were Found

Things, another 8% had only verbal additions made by the contributor, and the remaining 34% were made or in some way modified by the entrant.

Description of entrants. Seventy-eight percent of the contest entrants were identifiable as females and 13% as males; the remaining objects were contributed by children, several persons working together, or persons whose sex could not be determined. Of the females, marital status was given by 51%; 83% of these were married. Thus, the sample was heavily biased toward married females.[3] It was also probably biased toward whites: For those on whom census data were obtained, virtually all (96%) lived in census tracts whose population in 1960 was 50% or more white, and 83% lived in tracts which were 90% or more white.

Finally, the sample was composed of individuals of slightly above average social class. Table 2 presents for each borough the medians, means, and standard deviations on the two socioeconomic indices for the sample along

---

Insert Table 2 about here

---

with the median on these indices for the borough as a whole. By t-test, median years of schooling for the tracts from which this sample was drawn averaged significantly above the median for the borough in two of the three boroughs, while family income averaged significantly above the borough median in all three; the combined probability level over the three boroughs is less than .0001 for each variable.

Originality ratings and entrant characteristics. Originality ratings by the four judges intercorrelated from .41 to .61, with a median intercorrelation of .55. The final originality score for each object was obtained by averaging the four ratings for the object; the reliability of this average score was .80 (Winer, 1962, pp. 126-127).

Correlations between mean originality scores and entrant characteristics are shown in Table 3. The correlations are presented both for all the objects

---
Insert Table 3 about here
---

available, and when sample size permits, for the subsets of objects characterized as Made Things and Found Things. These subsets were examined separately for two reasons. First, it was thought possible that only the Made Things would provide satisfactory indices of creative ability--those objects that were simply sent in their preexisting state might represent less effort and involvement and, therefore, give a less valid indication of the creative potential of the respondent. Second, in preliminary attempts to judge materials of this kind it appeared that judges were able to make reliable ratings only for those objects which were constructed or altered by the respondent. However, the latter was not true in this sample; the median interjudge correlations were .39 for the Found Things and .49 for the Made Things. Each of these coefficients was significantly different from zero ($p < .001$ for each), and they did not differ significantly from one another.

As indicated in Table 3, originality judgments were unrelated to the sex and marital status of the respondents for the sample as a whole. The numbers of males and of unmarried females in the sample were too small to permit presentation of correlations with sex and marital status for the Made Things and Found Things subsets.

For the total sample, there were also no significant relations between originality ratings and socioeconomic indices. However, when Made Things and Found Things were considered separately, significant correlations did appear for the former. Years of schooling correlated .32 with originality ($p < .01$), and family income correlated .24 ($p < .05$). The two subsets were not composed

of respondents of different social class levels; their means on the two indices were quite similar ($t < 1$ for each index). They did, as expected, differ in their mean level of judged originality (for Made Things, $M = 4.02$, $S.D. = 1.35$; for Found Things, $M = 2.39$, $S.D. = 1.19$; $t = 5.40$, $df = 230$, $p < .001$).

Discussion

The findings of Study 1 can be summarized as follows: The sample consisted primarily of married white females, drawn from a socioeconomic level which was significantly above the average for the boroughs in which they lived. Approximately one-third of the individuals in this sample actually created or modified the products they submitted. There was no association between socioeconomic status and the Made Things-Found Things dichotomy. There was, however, a significant association between social status measures and originality for entrants whose products represented some investment of effort.

Study 2

The first purpose of Study 2 was to provide a replication of the findings of Study 1. Two new samples, one of Made Things and one of Found Things, were drawn from the contest entries, and census data on socioeconomic status were obtained. Judges were given the task of assigning the objects scores on the seven-point originality scale. One group of judges was given the set of Made Things to judge, without being informed that entries in the Found Things category had also been submitted to the contest; a second group judged Found Things, without knowledge of the existence of a set of Made Things. This

procedure was introduced to assure that the failure of the originality scores for Found Things to relate to the socioeconomic data could not be attributed to a possible restriction of range in these judgments resulting from unfavorable comparison with Made Things. A third group of judges was given a sample including both Made and Found Things drawn from those given to judges of the first two groups, and thus had a task identical to that of the judges in Study 1. This group made it possible to judge whether the nature of the originality ratings for either type of object was changed as a function of the set within which the ratings were made.

Study 2 was also intended to provide information on the bases used by judges in determining the originality of a product. Five dimensions, each presumably simpler than "originality," were selected a priori for investigation; these were the complexity of an object, the amount of effort invested in producing it, its attractiveness, its unusualness, and its humorousness. Each judge of those in the first two groups was given the task of rating one set of objects on one of these dimensions; she rated the Made Things on this dimension if she had previously rated Found Things on originality, and the Found Things if she had previously rated Made Things on originality. Each set was rated on each dimension by two independent judges, except that amount of effort was not rated for Found Things.

Method

Preparation of objects. Contents of five more mailbags were examined. Objects were included in the sample if they met all of the following criteria: They were nonperishable; the sender was from Brooklyn, the Bronx, or Manhattan; the sender was not a child, a group of persons, or a person of undetermined sex; and the object could be categorized as a Found Thing or a Made Thing.

After three bags had been examined, only Made Things were retained from the final two bags. The resulting sample consisted of 131 Found Things and 103 Made Things. Numbered tags were attached, other identifying information was removed, and a roster was prepared providing information on sex, marital status for females, and the address of the respondent. Census data were then obtained for these objects; the data obtained were limited to median years of schooling and median family income, the two indices which provided the only significant relations between census data and product originality in Study 1.

Judges. Judges were twenty-six women, wives of graduate students, recruited through notices posted on bulletin boards in two graduate student housing projects. They were paid for their participation. The first eighteen volunteers were randomly assigned to groups, eight to judge the originality of Made Things and ten to judge Found Things. The final eight were assigned the mixed set of objects.

Procedure. In the first part of the study each judge rated one of three sets of objects for originality. One group rated the 131 Found Things; a second rated the 103 Made Things; and the third rated 120 objects, a random sample of 60 from each of the first two sets.[4] Instructions to the judges included a short explanation of the origin of the objects and the definition of an original contribution as "one which is clever and unusual, one which shows imagination." Judges were encouraged to use all points of the seven-point rating scale, not to skip any objects, and to take as long as they liked to complete the ratings. Each judge worked alone in a large room with ample table space. She laid out all the objects in the set, spent as much time as she wished in examining them, and then entered her judgments on a rating sheet on which objects were identified by their tag number.

After a thirty-minute interval filled with a paper and pencil task, judges who had rated Found Things for originality in the first part of the study were shown the set of Made Things, while those who had rated Made Things were shown the Found Things. Those who had rated the mixed set of objects did not participate in this part of the study. The judge was told that we wanted to discover whether there were certain characteristics of objects that systematically affected how they were judged on originality. She was then given a definition of the one dimension she was to rate for this set of objects, encouraged to use all seven points on the rating scale, and left as before to complete her judgments.

The five dimensions rated in this part of the study were defined as follows:

Complexity refers to the number of elements or units making up the object.

Infrequency refers to how rare or uncommon this object or objects like it are in this set of things.

Humor refers to how clever or humorous the object is.

Attractiveness refers to how appealing or pleasant to look at the object is.

Amount of effort involved refers to the effort expended in producing this object by the person who contributed it.

Of the ten judges who had rated Found Things on originality, two were assigned at random to rate each of these five dimensions for the Made Things. Of the eight who had rated Made Things on originality, two were randomly assigned to rate each of the first four of these for Found Things. Amount of effort was not rated for Found Things, since by definition the respondent had not expended any effort in producing the object.

Results

Description of objects and of entrants. There were no evident differences between the present sample of objects and those examined in the first study. It should be recalled that the more nearly equal numbers of Made and Found Things in this sample than in Study 1 resulted from a sampling decision.

Entrant characteristics were also quite similar to those in Study 1. Eighty-three percent of the entrants were female, and of those females whose marital status could be ascertained, 88% were married. Entrants were of slightly above average social class; as in Study 1, median years of schooling for the tracts represented in this sample was significantly higher than the borough median in two of the three boroughs, and median family income was above the borough median in all three; the combined probability level is less than .0001 for each index. As in Study 1, years of schooling for entrants from Manhattan was the one borough-by-index combination for which a significant difference from the borough average was not obtained.

Originality ratings and entrant characteristics. Originality ratings made by the ten judges who were given the set of Found Things intercorrelated from .02 to .63, with a median of .37; those by the eight judges given the Made Things intercorrelated from .18 to .63, with a median of .41. Each of these median correlations was significantly different from zero ($p < .001$), and they did not differ significantly from one another.

Ratings of objects in the mixed set were correlated with those of the same objects made by judges in the first two groups. For the 59 Found Things which appeared in the mixed set, the mean originality ratings by judges given this set correlated .82 with the mean originality ratings by judges given the

set of Found Things. The comparable correlation for the 57 Made Things in the mixed sets was .76. Thus when originality ratings were averaged over a set of judges they were highly reliable, and the heterogeneity of the set of objects within which ratings were made had no apparent effect on the relative ordering of the ratings assigned to objects of either type.

Relations between mean originality ratings and entrant characteristics are presented in Table 4. As in Study 1, there were no sex differences in

---
Insert Table 4 about here
---

originality. There were too few unmarried females in the sample to permit examination of marital status differences. The two social status variables, education and income, showed nonsignificant correlations with originality for the set of Found Things ($p > .10$). However, income was significantly related to originality for Made Things ($r = .29$, $p < .01$), while years of schooling showed a marginally significant correlation with originality for objects in this set ($r = .18$, $p < .08$).

The most powerful test that can be made with the present data of the relations between social status and originality for the two sets of objects is provided by average correlations across the two studies. For Found Things, originality had an average correlation of .11 ($p < .07$) with years of schooling and of .07 ($p < .25$) with income; for Made Things, originality correlated on the average .24 ($p < .005$) with years of schooling and .27 ($p < .001$) with income. The average correlation with income was significantly higher for Made than for Found Things ($p < .01$), while that with years of schooling did not show a significant difference between Made and Found Things.

Bases for originality ratings. The additional dimensions on which the objects were rated proved to have moderate interjudge reliability, the

coefficients ranging from .40 to .80 with a median of .64. Correlational data involving these dimensions for each set of items are presented in Table 5. Multiple correlations were obtained between average originality

---
Insert Table 5 about here
---

and the four or five additional dimensions rated for each set; only linear main effect terms were included in the analysis. For Found Things using four predictors, the multiple correlation was .66 ($p < .001$); as suggested by the data in Table 5, infrequency made the largest single contribution of variance (30% of the variance in mean originality) and humor added significant additional variance (11%). For Made Things using five predictors, the multiple correlation was .83 ($p < .001$); humor accounted for 47% of the originality variance, effort added 17%, and attractiveness added an additional 4%.

Similar multiple correlations were computed between originality ratings by each individual judge and ratings of other characteristics of the objects. For eight of the ten persons who rated Found Things, and for all of the eight who rated Made Things, the multiple correlation was significant at the .001 level; the range over all judges was from .25 to .73 (Median = .53) for Found Things, and from .47 to .71 (Median = .64) for Made Things. There were differences in the order in which variables entered the multiple: For Found Things, infrequency was the best single predictor of originality for six judges, and humor was best for three. For Made Things, humor was best for five judges, and amount of effort for the remaining three. However, judges did not adopt sharply different strategies; rather, their judgments were to some extent multidimensionally determined. One way to demonstrate this is to consider the increment in prediction of originality ratings, when

comparing predictions based on the best single predictor for a judge with those based on the whole set of dimensions. Fourteen of eighteen comparisons showed a significant increase in variance accounted for by the set of predictors as opposed to the single predictor; on the average, the set of predictors accounted for 41% more variance than did the best single predictor for Found Things, and 43% more than did a single predictor for Made Things.

Finally, multiple correlations between originality and the set of additional dimensions rated were calculated for judges who had rated the mixed set of objects; one set of correlations was calculated over the ratings of Found Things in the mixed set, another over the ratings of Made Things. Results for these eight judges were similar to those from the other groups: Significant multiple correlations were obtained for seven of the eight judges for their ratings of Found Things, and for all eight for their ratings of Made Things; the median R was .54 for Found Things and .68 for Made Things. Six of the eight judges' originality ratings of Made Things were best predicted by humor; four of the eight judges' ratings of Found Things were best predicted by infrequency.

Discussion

The task given to judges in this investigation was both arbitrary and vague--arbitrary in that the originality rating was only one of many ways in which creativity could have been operationalized; vague in that the only instruction consisted of the definition of the scale to be used. Nonetheless, originality ratings proved to be highly reliable and to be stable over a change in the size and heterogeneity of the set of objects being rated. Thus, the operationalization appears to have been successful.

One purpose of Study 2 was to examine the bases used by judges in making these ratings. Several of the dimensions that were chosen as possible components of originality did indeed account for much of the variance in the average ratings. In fact, the multiple correlation relating an individual judge's originality ratings to ratings by other judges of these additional dimensions was significant for 16 of the 18 judges who rated originality for the set of Made or Found objects in Study 2. However, no clear-cut subgroups of judges were found who differed on the basis used for originality ratings. Individuals differed as to which of several dimensions provided the best single predictor of their ratings, but prediction was significantly improved for most judges by considering the remaining dimensions as well. On the other hand, the dimensions which were most closely associated with originality differed across the two sets of objects that were distinguished. For both Made and Found Things, humor was an important contributor to the originality rating; but for the former, amount of effort invested in the object was also important, while for the latter, the infrequency of the object had an effect. Individual differences among judges might reflect dimensions with implications of importance beyond the present situation, but it is not obvious that stimulus set differences do. Therefore, perhaps the only importance of these findings is their further demonstration that judges were behaving reliably and that their ratings made reasonably good sense.

The other major purpose of these studies was to determine whether a relationship existed between the creativity shown in the set of products and several characteristics, especially sex and socioeconomic status, of the individuals who contributed those products. For sex, the test was not a good one: There was a substantial disproportion in the number of males and females who participated; and as the contest was announced mainly during

working hours, it is quite possible that those males who did contribute represented a somewhat special population, such as retired individuals. Bearing in mind these limitations, there was no indication of differences either in the kinds of products given by males and females (for example, in the proportion of Made and Found Things submitted by each sex) or in their creativity. This lack of difference is consistent with the findings of the majority of studies in which objective measures of creativity have been administered to relatively unselected samples of individuals. With them, it raises the possibility that, when males and females have equal opportunity and incentive for creative production, their products will be equally creative, and that the preponderance of males among those whose professional productivity has been noteworthy is due to factors other than the capacity for creativity.

The two social class indices, on the other hand, did show significant correlations with the measure of creativity. The relations were not strong, averaging around .25 for each index; but given the highly indirect nature of the measurement, it is striking that any relationship emerged at all. The association was, however, limited to those objects that were made or modified by their contributors. The division into Made and Found Things was assumed to be a division into those things which represented at least a moderate investment of effort by the sender and those that represented essentially no effort; the rationale for looking at correlations separately for these groups was that only those things in which effort had been invested might provide a good index of the creative ability of the entrant. The reasonableness of either assumption could be questioned: Individuals could have invested a great deal of effort in deciding which of many objects around them was the most clever little green thing; and some very clever choices of Found Things

might have failed to be recognized as such either because of limitations in the judges, who were a somewhat select group (graduate student wives and research assistants), or of limitations in the judgmental situation, in which there was no first-hand information on the process entrants went through in selecting objects. It could even be that two distinct kinds of creativity are represented by the two kinds of contest entries--the one more passive and perceptual, involving the intuitive recognition of an apt solution to the problem posed by the contest, the other more active and assertive, involving the creation of a solution.[5] In the absence of contrary evidence, however, it seems most parsimonious to construe the difference in the two kinds of entries as a difference in whether or not these products represented a serious attempt at creativity on the part of the contributor, and therefore whether they did provide a basis for judging his or her creativity.

Why a social class difference in creativity was found remains unexplained. Among those individuals who chose to participate, there was no association between socioeconomic status and the probability that the individual would minimize the effort he had to expend. Moreover, it is not at all obvious that the creation of a product which judges would rate high on originality required skills, materials, or associations which should be more available to individuals having greater affluence or educational level. The results do suggest that situations like the present one, requiring a tangible though modest creative product, can provide useful information beyond what is available from measures which are more heavily dependent on verbal-symbolic processes. Here a simple nonlaboratory problem produced positive associations between creativity and socioeconomic status, whereas studies with paper and pencil measures of creativity have generally failed

to find such an association. Perhaps most useful would be studies in which the two kinds of information were combined--where individuals would first engage in nonlaboratory creative efforts and then provide more direct information on their personal characteristics and on the processes in which they engaged in arriving at their products.

References

Atherton, K. R. A comparison of solutions obtained in factor analyses of socioeconomic variables. Psychological Reports, 1962, 11, 259-273.

Covington, N. Creativity in culturally deprived adolescent boys. Dissertation Abstracts, 1968, 29, 1608A.

Helson, R. Sex differences in creative style. Journal of Personality, 1967, 35, 214-233.

Helson, R., & Crutchfield, R. S. Mathematicians: The creative researcher and the average Ph.D. Journal of Consulting and Clinical Psychology, 1970, 34, 250-257.

Hochbaum, G., Darley, J. G., Monachesi, E. D., & Bird, C. Socioeconomic variables in a large city. The American Journal of Sociology, 1955, 61, 31-38.

Hollingshead, A. B. Two factor index of social position. A. B. Hollingshead, 1965. Yale Station, New Haven, Conn. Copyright 1957.

Kahl, J. A., & Davis, J. A. A comparison of indexes of socioeconomic status. American Sociological Review, 1955, 20, 317-325.

Klausmeier, H. J., & Wiersma, W. Relationship of sex, grade level, and locale to performance of high IQ students on divergent thinking tests. Journal of Educational Psychology, 1964, 55, 114-119.

MacKinnon, D. W. The nature and nurture of creative talent. American Psychologist, 1962, 17, 484-495. (a)

MacKinnon, D. W. The personality correlates of creativity: A study of American architects. In G. S. Nielsen (Ed.), Proceedings of the XIV International Congress of Applied Psychology, Copenhagen, 1961. Vol. 2. Copenhagen: Munksgaard, 1962. Pp. 11-39. (b)

Neumann, E. On the moon and matriarchal consciousness. Spring, 1954 (Analytical Psychology Club of New York). Cited in Helson, 1967.

Savoca, A. F. The effects of reward, race, IQ, and socioeconomic status on creative production of preschool children, 1965. Ann Arbor, Michigan: University Microfilms, Inc., No. 65-11, 405.

Skager, R. W., Schultz, C. B., & Klein, S. P. Points of view about preference as tools in the analysis of creative products. Perceptual and Motor Skills, 1966, 22, 83-94.

Terman, L. M., & Oden, M. H. Genetic studies of genius. IV. The gifted child grows up: Twenty-five years' follow-up of a superior group. Stanford, California: Stanford University Press, 1947.

Torrance, E. P. Explorations in creative thinking in the early school years: A progress report. In C. W. Taylor & F. Barron (Eds.), Scientific creativity: Its recognition and development. New York: Wiley, 1963. Pp. 173-183.

U. S. Bureau of the Census, U. S. Censuses of population and housing: 1960. Census tracts. Final Report PHC (1)-104, Part 1. Washington, D. C.: U. S. Government Printing Office, 1962.

Wallach, M. A., & Kogan, N. Modes of thinking in young children: A study of the creativity-intelligence distinction. New York: Holt, Rinehart, & Winston, 1965.

Winer, B. J. Statistical principles in experimental design. New York: McGraw-Hill, 1962.

Zambito, S. C. A comparison of group versus individual production of non-verbal artistic creativity. Dissertation Abstracts, 1968, 29, 824A.

Footnotes

[1]Appreciation is owed to WNBC Radio, and particularly to Mr. Robert M. Adams, Advertising and Promotion Manager, for the creative products used in this research; and to Drs. Leonard Cahen and Norman Frederiksen for critical reviews of the manuscript.

[2]Thirty-one more objects were discarded at this point, when it was discovered that their contributors had submitted two objects in the sample of 314. In each case the second object listed for a person on the roster was the one discarded. The remaining 283 objects constituted the sample which was judged on originality. For thirty of these the census tract corresponding to the address could not be identified; these were excluded from all further analyses of the data. Finally, there were twenty-one objects for which the census tract was located but for which the census report did not provide either income or educational medians, and several additional ones for which it provided one of these averages but not the other. These objects were included in all analyses for which these missing data were not relevant.

[3]These percentages are based on an N of 253. Similar calculations were also performed using all the objects contained in four mailbags, less only those discarded as perishable. For these 888 objects, the sex and marital status percentages are comparable to those in the subset retained for analysis: 74% of the entrants were known to be female; and of females whose marital status was known, 87% were married.

[4]After elimination of objects for which census data could not be found, the Ns for all analyses were reduced to 127 for Found Things, 99 for Made Things, and for objects in the mixed set, to 59 Found Things and 57 Made Things.

[5]This distinction is suggested by Neumann's (1954) description of two kinds of consciousness, the "matriarchal" and the "patriarchal," for which Helson (1967) found some justification in contrasting creative female mathematicians, creative male mathematicians, and uncreative comparison subjects.

Table 1

Description of Objects in Study 1 Sample

Percent of Sample	Category
23.6	Saint Patrick's Day artifacts, including:
	Shamrocks (plastic, real, or paper cut-outs) (5.2% of total sample)
	Figurines (5.2%)
	Leprechaun apparel, cane, tooth, etc. (2.4%)
	Greeting cards (3.1%)
	Other; e.g., bow ties, blarney stone, dish towel (7.7%)
9.8	Figurines without Irish reference (approximately half monstrous or creepy, half benign)
9.8	Leaves, ferns, flowers, four-leaf clovers
5.6	Cut-outs from newspapers, magazines; including 1.4% Green Giant Brand figures
4.5	Stamps (trading and postage)
2.1	Money (mostly play money bills)
3.5	Wearing apparel (doll clothes, garter belts, etc.)
3.5	Food (generally plastic or dried; e.g., split peas, parsley flakes)
11.1	Household items (3.5% thread, ribbon or yarn; clothes-pins, toothpicks, bulb, pens, etc.)
9.1	Small plastic items (e.g., ring, whistle, horseshoe)
3.5	Small paper items (e.g., coin wrappers, parking ticket stub)
2.4	Plays on words (e.g., "Thing" written in green ink)
11.5	Other

Table 2

Comparison of Social Class Indices for Study 1 Sample

with Averages for the Boroughs Sampled

	Borough		
Index	Manhattan	Bronx	Brooklyn
Years of Schooling			
Borough Median	10.6	9.5	9.5
Sample Median	11.1	10.1	9.9
Mean	10.5	10.1	10.2
S.D.	2.0	0.9	1.4
N	67	80	81
t	<1	5.6	4.6
p <	n.s.	.001	.001
Family Income			
Borough Median	5338	5830	5816
Sample Median	5889	6585	6337
Mean	6153	6576	6318
S.D.	2077	846	1370
N	67	80	79
t	3.2	7.9	3.3
p <	.01	.001	.001

Table 3

Correlations Between Mean Originality Ratings and Entrant Characteristics in Study 1

Characteristic	All Items		Made Things		Found Things	
	r	N	r	N	r	N
Sex[a]	.03	230				
Marital Status for Females[a]	.03	118				
Years of Schooling	.10	249	.32**	76	.11	152
Family Income	.08	247	.24*	75	.05	151

[a]Note.--Correlations for sex and marital status are point biserial; for sex, Male = 0, Female = 1; for marital status, Unmarried = 0, Married = 1. Correlations involving these variables are not presented separately for Made Things and Found Things because of the small N's ($\leq$ 14) for the smaller group involved in each correlation.

*$p < .05$.

**$p < .01$.

Table 4

Correlations Between Mean Originality Ratings

and Entrant Characteristics in Study 2[a]

Characteristic	Made Things	Found Things
Sex	-.01	-.06
Years of Schooling	.18	.12
Family Income	.29**	.10

[a]Note.--Correlations for sex are point biserial; Male = 0, Female = 1. N for Made Things = 99; N for Found Things = 127.

**p < .01.

Table 5

Correlations Among Dimensions Rated in Study 2[a]

	Attractiveness	Humor	Complexity	Infrequency	Effort
Made Things					
Originality	.24	.68	.59	.26	.62
Attractiveness	(.51)	-.11	.29	-.06	.24
Humor		(.64)	.40	.38	.34
Complexity			(.67)	.08	.65
Infrequency				(.50)	.33
Effort					(.80)
Found Things					
Originality	-.27	.43	-.19	.55	
Attractiveness	(.40)	-.05	.18	-.30	
Humor		(.49)	.03	.19	
Complexity			(.64)	-.07	
Infrequency				(.69)	

[a]Note.--For Made Things, $N = 99$, $r = .26$ for $p < .01$; for Found Things, $N = 127$, $r = .23$ for $p < .01$. Entries in parentheses are reliabilities.